

were well known to those of ordinary skill in the art.¹ Consequently, the recitation of magnetostatic coupling inherently implies discontinuity between the readout and recording layer.

A discontinuity between readout and recording layers necessary to create a magnetostatic field can be created by an intermediate layer. In column 4, lines 35-37 of the '944 patent it is disclosed that "... an intermediate layer for adjusting exchange coupling force or magnetostatic coupling force. . . may be formed"; and from column 6, lines 8 to 14, it is clear that magnetic recording and readout layers are either directly layered in an exchange coupled relationship, or arranged "with an intermediate layer therebetween" in a magnetostatically coupled recording medium. Thus, the presently claimed intermediate layer, added such that coupling between the readout layer and recording layer is by magnetostatic coupling, finds support in the application as filed.

That it was well-known in the art that magnetostatic coupling requires a discontinuity between the readout and recording layer, typically provided by an intermediate dielectric layer, is shown, for example, in U.S. Patent No. 5,168,482, col. 5, lines 51 to 61, a copy of which is provided with an Information Disclosure Statement provided herewith. Particular dielectric materials that would be suitable for this purpose in a magneto-optical recording medium are described in the '944 patent at col. 4, lines 30 to 41.

¹ The physics of a magnetostatic or "stray" field are described in excerpted pages from Leon I. Maissel and Reinhard Glang, "Handbook of Thin Film Technology," McGraw Hill (1983) submitted on an Information Disclosure Statement herewith.

Support for the intermediate magnetic layer is found throughout the specification and claims as originally filed. See, for example, the '944 patent at col. 6, lines 34 to col. 9, line 15.

II. Priority Document – Claim to Priority

The certified copy of priority document JP-A 230265 was provided with a claim to priority during prosecution of the parent application no. 09/111,974, now U.S. Patent No. 5,616,428. Applicants submit that an additional certified copy is not required to be filed, pursuant to M.P.E.P. § 201.14(b). A copy of the priority document and the transmittal, together with an English translation of the priority document are provided herewith for the Examiner's convenience.

III. The Technology – Magnetostatic versus Exchange Coupling

Before turning to the merits of the rejection, applicants wish to point out the significant differences between a magneto-optical recording medium having layers coupled by magnetostatic coupling (to which the present claims are directed) and a medium having layers coupled by exchange coupling. Exchange coupling between magnetic layers occurs when the atomic spins in two adjacent layers of magnetic material are aligned.

Magnetostatic coupling, in contrast, is generated by a magnetostatic or "stray" field, created by a separation of charges in a magnetic material. Magnetostatic coupling between thin magnetic layers usually requires an interposed intermediate layer to prevent aligning of atomic spins in two adjacent magnetic layers, but may be brought about by an otherwise imperfect interface between two layers. In other words, the intermediate layer insulates the magnetic fields of adjacent magnetic layers from each other to prevent exchange coupling.

It is the magnetostatic or "stray" field of a non-exchange-coupled magnetic layer which induces a readout magnetic layer to change magnetic orientation at elevated temperatures. The direction of the magnetostatic or stray field follows the field lines generated by the separated charges. Accordingly, the present claims are materially different from, and may be deemed narrower than, those allowed in the '944 patent, notwithstanding that certain limitations pertaining to the intermediate magnetic layer have been omitted, because they recite a magnetostatically coupled device. This is even clearer in claims 6 and 7 which expressly recite an intermediate layer for magnetostatic coupling.

IV. Rejection Under 35 U.S.C. § 251

Turning to the outstanding Office Action, claims 3-5 have been rejected under 35 U.S.C. § 251 as being an improper recapture of subject matter surrendered in the application for the patent upon which the present reissue is based, the '944 patent.

Applicants respectfully traverse because the claims have been materially narrowed by the recitation of magnetostatic coupling, which requires elimination of exchange coupling and institution of magnetostatic coupling. Accordingly, even though Applicants have deleted from the broadest independent claim the originally claimed intermediate magnetic layer that was added to the independent claims of the '944 patent during prosecution, the claimed invention has been narrowed by the recitation of magnetostatic coupling, which is a different and, essentially, an antagonistic embodiment to a medium which is exchange-coupled.

The recapture rule prevents a patentee from regaining, through reissue, subject matter that was previously surrendered in an effort to obtain allowance of the

original patent claims. See Pannu v. Storz Instruments, (citation not yet available, copy attached at TAB 2) (Fed. Cir. Dec. July 25, 2001).

In Pannu, the Federal Circuit articulated a three step process for determining if the recapture rule renders reissue claims unpatentable:

The first step is to determine whether and in what aspect the reissue claims are broader than the patent claims. The second step is to determine whether the broader aspects of the reissued claim related to surrendered subject matter. Finally the court must determine whether the reissued claims were materially narrowed in other respects to avoid the recapture rule. (internal citations and quotation marks omitted).

Even if it is assumed, arguendo, that the reissue claims are broader in some respects which relate to surrendered subject matter, nonetheless it is submitted that the reissue claims have been materially narrowed in other respects. Claims which have been amended to recite overlooked aspects of the invention can constitute an exception to the recapture rule. The Federal Circuit has held that claims which are broader in certain respects and narrower in others may avoid the effect of the recapture rule. In re Clement, 131 F.3d 1464, 1470 (Fed. Cir. 1997); Mentor Corp. v. Coloplast, Inc., 998 F.2d 992, 996 (Fed. Cir. 1993). In order to avoid the recapture rule by “materially narrowing” the reissue claims, the reissue claims must be narrower in aspects germane to the prior art rejections. See Clement, 131 F.3d at 1470. In the event that the reissue claims are broader and narrower in aspects which were previously surrendered, the courts will perform a balancing test to determine if the claims are “materially narrower.” See Clement, 131 F.3d at 1471. As set forth most recently in Pannu, the reissue claims must be narrowed in a material aspect “compared with their broadening” (citation not yet available).

In Hester v. Stein, 142 F.3d 1472 (Fed. Cir. 1998), the court noted that claims which were broader in areas surrendered during prosecution but that were, nevertheless, materially narrower in “overlooked aspects” of the invention and could, therefore, constitute an exception to the recapture rule. “The purpose of this exception to the recapture rule is to allow the patentee to obtain through reissue a scope of protection to which he is rightfully entitled for such overlooked aspects.” 142 F.3d at 1483. See also Ball Corp. v. United States, 729 F.2d 1429 (Fed. Cir. 1984). Applicants submit that the presently claimed magnetostatic embodiment constitutes such an “overlooked aspect” of the invention, which applicants should be entitled to obtain through reissue.

Claim 3 recites that the reproducing layer is magnetically coupled to the recording layer by magnetostatic coupling. Naturally, magnetostatic coupling requires the presence of a magnetostatic field, which, in turn, requires that exchange-coupling be disrupted between the recording layer and readout layer. The required disruption can be accomplished by, for example, interposing an intermediate layer between the readout and recording layers, as disclosed in the prior art Aratani ‘482 patent. However, one of ordinary skill in the art would have recognized that other arrangements could produce a magnetostatic field, such as a rough interface between recording and readout layers, an accumulation of impurities in an intermediate magnetic layer or a magnetic intermediate layer which has domains oriented in a direction which disrupts exchange coupling.

Where coupling between various magnetic layers is no longer mediated by exchange force, but by magnetostatic force, this is sometimes called “central aperture detection” and permits low power laser beams to be employed to readout an upper layer from a recorded domain of a recording layer residing in a storage layer. This is a real

technical advantage in reducing energy requirements, size and cost of the recording medium.

Claim 6 adds an intermediate layer for magnetostatic coupling to the two layer structure originally claimed, and thereby recites a materially narrower and overlooked embodiment than that claimed in the issued '944 patent. The issued claims of the '944 patent are directed to a magneto-optical recording medium having an intermediate magnetic layer which assists in raising resolution of the medium but does not interfere with exchange coupling. By linking or exchange-coupling the spins of the top and bottom layers to keep internal magnetic fields parallel, the magnetic behavior of one layer can be locked to the behavior of another. The intermediate magnetic layer of the '944 patent does not interfere with the exchange-coupled magnetic alignment of the recording and readout layers.

To the contrary, in magnetostatic coupling, for example, the intermediate layer interferes with the magnetic fields of the recording and readout layers, so that there is no alignment of spins of the layers (exchange coupling). In magnetostatic coupling discontinuities in the internal magnetic field present at a boundary between an intermediate layer and a magnetic layer create poles. These poles induce magnetostatic or "stray" fields to facilitate magnetic coupling between magnetic multi-layers. As described above, in a magnetostatically coupled medium, the magnetization direction and coupling can be controlled by the presence of a suitable intermediate layer which promotes magnetostatic coupling, as contrasted with the presence of a magnetic intermediate layer which is compatible with exchange coupled layers.

Accordingly, instant Claim 6 has been materially narrowed compared to the claims of the issued '944 patent in that this claim recites a third layer which produces

magnetostatic coupling between the layers. In Claim 7, the intermediate layer is a dielectric layer for providing magnetostatic coupling and, additionally, a magnetic layer is also present.

For the foregoing reasons, Applicants submit that the present claims avoid the recapture rule, notwithstanding that the reissue claims can be deemed broader in some aspects than the issued claims of the '944 patent, because the reissue claims are also materially narrower in reciting overlooked aspects of the invention.

V. U.S. Patent No. 6,261,707

Applicants have submitted herewith an Information Disclosure Statement, making of record recently issued U.S. Patent No. 6,261,707 B1 ('707 patent). Applicants submit that the present claims do not correspond exactly or substantially to any claim of the '707 patent, including claim 11, at least because claim 11 requires inter alia "an intermediate layer made of non-magnetic film which is formed between said readout layer and said recording layer." Applicants note that instant claims 3 and 4 do not recite an intermediate layer of a non-magnetic film. Instant claims 5 and 7 require the presence of an intermediate magnetic layer not recited in claim 11. Claim 6 is not limited to a "non-magnetic" film. Magnetostatic coupling can be arrived at by means other than an intermediate "non-magnetic" film. Accordingly, it can be deemed that no interfering subject matter exists between the present claims and the claims of the issued '707 patent, including claim 11.

Entry and consideration of the foregoing Amendment and Remarks and passage of the application to issue are respectfully requested.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,



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